

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
TYLER DIVISION**

<b>ADAPTIX, INC.,</b>	§	
v.	§	
<b>ERICSSON, INC., et al.</b>	§	No. 6:14-CV-501
	§	
<b>ADAPTIX, INC.,</b>	§	
v.	§	No. 6:14-CV-502
<b>ERICSSON, INC., et al.</b>	§	
	§	
<b>ADAPTIX, INC.,</b>	§	
v.	§	No. 6:14-CV-503
<b>ERICSSON, INC., et al.</b>	§	
	§	

**MEMORANDUM OPINION AND ORDER**

The above-referenced case was referred to the undersigned United States Magistrate Judge for pre-trial purposes in accordance with 28 U.S.C. § 636. Before the Court are Plaintiff’s Opening Claim Construction Brief (Dkt. No. 46), Defendants’ response (Dkt. No. 51), and Plaintiff’s reply (Dkt. No. 56).<sup>1</sup> Also before the Court are the parties’ Local Patent Rule (“P.R.”) 4-3 Joint Claim Construction and Prehearing Statement (Dkt. No. 45) and P.R. 4-5(d) Joint Claim Construction Chart (Dkt. No. 60, Ex. A).

A claim construction hearing, in accordance with *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996), was held in Texarkana on June 17, 2015. After hearing the arguments of counsel and reviewing the relevant pleadings,

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<sup>1</sup> References to docket numbers herein are to Civil Action No. 6:14-CV-501 unless otherwise indicated.

presentation materials, other papers, and case law, the Court finds the disputed terms of the patents-in-suit should be construed as set forth herein.

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## **I. BACKGROUND**

Plaintiff Adaptix Inc. (“Plaintiff”) asserts United States Patents No. 6,870,808 (“’808 Patent”), 6,904,283 (“’283 Patent”), and 7,146,172 (“’172 Patent”) (collectively, the “patents-in-suit”) by Defendants Ericsson Inc., Telefonaktiebolaget LM Ericsson, Cellco Partnership d/b/a Verizon Wireless, T-Mobile USA, Inc., and Sprint Spectrum L.P. (“Defendants”).

In general, the patents-in-suit relate to wireless communications, such as for cellular telephones. More specifically, the patents-in-suit relate to orthogonal frequency division multiple access (“OFDMA”), in which the communication frequency bandwidth is divided into smaller “subcarriers.” These subcarriers are at closely-spaced frequencies but are “orthogonal,” meaning that they do not substantially interfere with one another. The patents-in-suit disclose systems and methods for allocating subcarriers among multiple “subscribers,” such as mobile cellular telephone units.

The ’808 Patent, titled “Channel Allocation in Broadband Orthogonal Frequency-Division Multiple-Access/Space-Division Multiple-Access Networks,” issued on March 22, 2005, and bears a filing date of October 18, 2000. Plaintiff submits: “The ’808 patent teaches allocating sub-carriers to each subscriber while taking into account frequency-dependent spatial information, e.g., associated with the use of plural base station antennas.” Dkt. No. 46 at 3.

The ’283 Patent, titled “Multi-Carrier Communications with Group-Based Subcarrier Allocation,” issued on June 7, 2005. The ’172 Patent, titled “Multi-Carrier Communications with Adaptive Cluster Configuration and Switching,” issued on December 5, 2006. Plaintiff submits: “The ’172 patent allocates sub-carriers in the form of different types of clusters for different subscribers, namely ‘coherence clusters’ and ‘diversity clusters.’” Dkt. No. 46 at 2-3.

Plaintiff also submits: “The ’283 patent discloses feedback approaches based on groups of clusters of subcarriers.” *Id.* at 3. The ’283 Patent and the ’172 Patent are both continuations-in-part of United States Patent No. 6,947,748, which bears a filing date of December 15, 2000.

Plaintiff’s opening brief submits Plaintiff is asserting Claims 1, 2, 4, 5, 7, 8, 9, 10, and 13 of the ’172 Patent, Claims 1, 2, 4, 9, 13, 14, 31, 32, 34 and 41 of the ’808 Patent, and Claims 92, 93, 94, 98, 99, 101, 102 and 107 of the ’283 Patent. Dkt. No. 46 at 1. Plaintiff argues the accused products operate in accordance with certain LTE (“Long Term Evolution”) wireless communication standards, which are sometimes referred to in common parlance as “4G LTE.” *Id.* at 3.<sup>2</sup>

The Court previously construed disputed terms in the patents-in-suit in a Memorandum Opinion and Order entered in the co-pending case of *Adaptix, Inc. v. Alcatel-Lucent USA, Inc., et al.*, No. 6:12-CV-22, Dkt. No. 141, 2014 WL 894844 (E.D. Tex. Feb. 26, 2014) (Craven, J.) (referred to herein as the “*Alcatel*” case).<sup>3</sup> The Court also denied a motion for reconsideration in *Alcatel. Id.*, Dkt. No. 170 (E.D. Tex. May 1, 2014) (Schneider, J.).

Defendants re-urge, in footnotes, various constructions that were proposed in *Alcatel*, but Defendants have not presented argument here as to those proposals:

Defendants submit that their previously presented constructions were the correct ones, and respectfully request that those constructions be adopted for the reasons Defendants presented in their claim construction brief dated December 20, 2013, and request for reconsideration dated March 12, 2014. However, recognizing that the Court is unlikely to be inclined to revisit claim construction issues that the Court has already considered and ruled on, and without waiving appeal rights with respect to the constructions advanced in [*Alcatel*], Defendants focus this

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<sup>2</sup> Plaintiff submits “[t]he Ericsson defendants provide the accused base stations for use in the cellular telephone networks of Sprint, Verizon Wireless and T-Mobile.” *Id.* at 1 n.1.

<sup>3</sup> This Memorandum Opinion and Order was also entered in related Civil Action Nos. 6:12-CV-122, -123, -369, 6:13-CV-49, -50.

brief on resolving issues that remain in dispute even assuming the Court were to adopt its earlier constructions.

Dkt. No. 51 at 2 n.3; *see id.* at 4 n.5, 6 n.7, 9 n.11, 15 n.14, 17 n.16, 17 n.17, 18 n.18, 20 n.19, 28 n.26. The Court hereby rejects Defendants' footnoted proposals for the same reasons set forth in *Alcatel* (*see* No. 6:12-CV-22, Dkt. Nos. 141 & 170).

## II. LEGAL PRINCIPLES

The claims of a patent define the invention to which the patentee is entitled the right to exclude. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). Claim terms are given their ordinary and customary meaning to one of ordinary skill in the art at the time of the invention, unless there is clear evidence in the patent's specification or prosecution history that the patentee intended a different meaning. *Phillips*, 415 F.3d at 1312-13. Claim construction is informed by the intrinsic evidence: the patents' specifications and file histories. *Id.* at 1315-17. Courts may also consider evidence such as dictionary definitions and treatises to aid in determining the ordinary and customary meaning of claim terms. *Phillips*, 415 F.3d at 1322. Further, "[o]ther claims, asserted and unasserted, can provide additional instruction because 'terms are normally used consistently throughout the patent.'" *SmartPhone Techs. LLC v. Research in Motion Corp.*, No. 6:10-CV-74-LED-JDL, 2012 WL 489112, at \*2 (E.D. Tex. Feb. 13, 2012) (citing *Phillips*, 415 F.3d at 1314). "Differences among claims, such as additional limitations in dependent claims, can provide further guidance." *Id.*

A court should "avoid the danger of reading limitations from the specification into the claim[s]." *Phillips*, 415 F.3d at 1323. For example, "although the specification often describes very specific embodiments of the invention, [the Federal Circuit has] repeatedly warned against confining the claims to those embodiments." *Id.* The Federal Circuit has "expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be

construed as being limited to that embodiment.” *Id.* This is not only because of the requirements of Section 112 of the Patent Act, but also because “persons of ordinary skill in the art rarely would confine their definitions of terms to the exact representations depicted in the embodiments.” *Id.* Limitations from the specification should only be read into the claims if the patentee “acted as his own lexicographer and imbued the claim terms with a particular meaning or disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction.” *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003) (citations omitted); *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1367 (Fed. Cir. 2012).

Similarly, the prosecution history may not be used to infer the intentional narrowing of a claim absent the applicant’s clear disavowal of claim coverage. *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (citations omitted). “To be given effect, such a disclaimer must be made with reasonable clarity and deliberateness.” *Id.*

In general, prior claim construction proceedings involving the same patents-in-suit are “entitled to reasoned deference under the broad principals of *stare decisis* and the goals articulated by the Supreme Court in *Markman*, even though *stare decisis* may not be applicable *per se*.” *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at \*4 (E.D. Tex. June 21, 2006) (Davis, J.); *see TQP Development, LLC v. Inuit Inc.*, No. 2:12-CV-180, 2014 WL 2810016, at \*6 (E.D. Tex. June 20, 2014) (Bryson, J.) (“[P]revious claim constructions in cases involving the same patent are entitled to substantial weight, and the Court has determined that it will not depart from those constructions absent a strong reason for doing so.”); *see also Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 839-40 (2015) (“prior cases will sometimes be binding because of issue preclusion and sometimes will serve as

persuasive authority”) (citation omitted); *Markman*, 517 U.S. at 390 (“[W]e see the importance of uniformity in the treatment of a given patent as an independent reason to allocate all issues of claim construction to the court.”).

Guided by these principles of claim construction, this Court directs its attention to the patents-in-suit and the disputed claim terms.

### III. CONSTRUCTION OF AGREED TERMS

The Court hereby adopts the following agreed-upon constructions:

<b>Term</b>	<b>Patent / Claims</b>	<b>Agreed Construction</b>
“SINRs”	’808 Pat., Cls. 9, 41	“Signal-to-Interference-plus-Noise Ratios”
“new subscriber”	’808 Pat., Cls. 14, 32, 41	“subscriber that has requested access but has not been assigned a traffic channel”
“accessing subscriber”	’808 Pat., Cls. 9, 31, 34	“subscriber that has requested access but has not been assigned a traffic channel”
“new accessing subscriber”	’808 Pat., Cls. 31, 34	“subscriber that has requested access but has not been assigned a traffic channel”
“allocate OFDMA channels using the broadband spatial signature vectors of the subscribers”	’808 Pat., Cl. 1	“allocate each of multiple OFDMA channels using more than one subscriber’s broadband spatial signature vectors”
“selection” / “selected”	’283 Pat., Cl. 92	“choice” / “chosen”
“SINR”	’283 Pat., Cl. 101	“Signal-to-Interference-plus-Noise Ratio”
“a group identifier”	’283 Pat., Cl. 102	“one or more data bits that identify the group”

Dkt. No. 45, Ex. A.



#### IV. CONSTRUCTION OF DISPUTED TERMS IN THE '172 PATENT

##### A. “diversity cluster of subcarriers,” “diversity cluster,” and “coherence cluster”

<b>“diversity cluster of subcarriers” and “diversity cluster” (’172 Patent, Claims 1, 4, 5, 10, 13)</b>	
<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“logical unit of multiple physical subcarriers that are relatively far apart, as compared to the subcarriers of a coherence cluster”	“logical unit <i>that exists at the time of allocation, as opposed to being constructed or defined in hindsight</i> , of multiple physical subcarriers that are relatively far apart, as compared to the subcarriers of a coherence cluster”
<b>“coherence cluster” (’172 Patent, Claims 1, 7, 13)</b>	
<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“logical unit of multiple physical subcarriers that are relatively close together, as compared to the subcarriers of a diversity cluster”	“logical unit <i>that exists at the time of allocation, as opposed to being constructed or defined in hindsight</i> , of multiple physical subcarriers that are relatively close together, as compared to the subcarriers of a diversity cluster”

Dkt. No. 60, Ex. A at 1-3 (emphasis added by the parties).

##### (1) The Parties’ Positions

Plaintiff proposes the *Alcatel* construction and argues that in *Alcatel* the Court rejected proposals similar to Defendants’ present proposal. Dkt. No. 46 at 6-7.

Defendants respond that the Court’s construction should include the Court’s finding that a cluster must exist at the time of allocation. Dkt. No. 51 at 4; *see id.* at 7. Defendants explain: “Defendants are not asking the Court to substantively change the construction it entered in the

related case, but rather to make explicit in its construction the point that Judge Schneider made in his commentary justifying the Court's construction." *Id.* at 6; *see id.* at 7.

Plaintiff replies that, in *Alcatel*, the Court "has already rejected Defendants' invitation to rearrange the claim language saying, '[b]ecause this is self-evident from the claim language, however, the Court need not modify or clarify the constructions of the disputed terms.'" Dkt. No. 56 at 1.

At the June 17, 2015 hearing, Defendants reiterated the Court has already found that "'clusters' used for purposes of feedback" must be tied to the "allocated clusters." *See* Dkt. No. 68, 6/17/2015 Hr'g Tr. at 67:25-68:9. Defendants urged that clarification of the Court's *Alcatel* construction is appropriate because Plaintiff's infringement theory in the co-pending *Alcatel* case is that two blocks of subcarriers could be *either* a single diversity cluster *or* two coherence clusters, "[a]nd the only way I could tell the difference is if I looked back at which particular allocation algorithm was used to choose the particular resource blocks." *Id.* at 69:23-71:3.

## (2) Analysis

Claims 1 and 7 of the '172 Patent, for example, recite (emphasis added)

1. A method for use in allocating subcarriers in an OFDMA system comprising  
allocating at least one *diversity cluster of subcarriers* to a first subscriber;  
and  
allocating at least one *coherence cluster* to a second subscriber, such that  
communication with the first and second subscribers is able to occur by  
simultaneously using the at least one *diversity cluster* and the at least one  
*coherence cluster*, respectively.

\* \* \*

7. The method defined in claim 1 wherein subcarriers of one *coherence cluster* are within the coherent bandwidth of a channel between a base station and a subscriber.

In *Alcatel*, the Court construed these disputed terms in the manner Plaintiff now proposes here. *See Alcatel*, Dkt. No. 141 at 9-18. In particular, the Court summarized the parties’ oral arguments presented at the *Alcatel* claim construction hearing as follows:

At the February 13, 2014 hearing, Defendants argued that Plaintiff’s proposed constructions blur the distinction between diversity and coherence clusters and would allow for post hoc, retrospective identification of such clusters. Defendants also urged that clusters must be classified prior to allocation because otherwise it would be impossible to determine or change the ratio between the types of clusters as required in dependent Claim 9. Defendants further argued that Plaintiff’s proposals would eliminate any differentiation between Claim 1 and dependent Claim 7.

Plaintiff responded that Defendants’ proposals are far too narrow because, for example, a coherence cluster need not include any adjacent subcarriers. Instead, Plaintiff argued, the issue is the spread between the “outermost” subcarriers in the cluster. Plaintiff also proposed the following alternative constructions: “coherence cluster” means “logical unit of multiple physical subcarriers that are close together such that the outer subcarriers are close to each other”; and “diversity cluster” means “logical unit of at least two disjoint, physical subcarriers spread over the spectrum to make probable that the outermost subcarriers in the cluster are outside the coherence bandwidth.”

*Id.* at 11-12. The Court rejected any reference to “coherence bandwidth,” finding it to be a feature of a preferred embodiment that should not be imported into the disputed terms, and the Court found:

. . . [T]he specification teaches that “coherence” and “diversity” are relative terms because those terms are used in relation to one another. For example, the specification explains that in network environments having both fixed subscribers and mobile subscribers, coherence clusters can provide higher performance for fixed subscribers whereas diversity clusters are more reliable for mobile subscribers. . . .

\* \* \*

. . . [T]he specification discloses the disputed terms in such a relative manner, as discussed above, and all of the claims of the ‘172 Patent require both a diversity cluster and a coherence cluster, such that the two are necessarily available for mutual comparison. At the February 13, 2014 hearing, Plaintiff had no objection to construing the disputed terms with reference to one another. Defendants had no objection to this general principle but maintained that the identification of

diversity clusters and coherence clusters, by whatever measure, must occur prior to allocation and must be done for the purposes set forth in Defendants' proposed constructions.

\* \* \*

. . . Defendants have failed to identify any reasonably clear definition of, or clear support for, the word "defined," which would tend to confuse rather than clarify the scope of the claims. Defendants' proposed constructions are therefore rejected. Defendants' proposal of the word "defined" is also discussed as to the term "cluster of subcarriers" in the '283 Patent, below.

*Id.* at 16-18. As to "clusters of subcarriers," then, the Court explained:

The recital of "partitioning subcarriers" [in Claim 24 of the '283 Patent] seemingly lends support to Defendants' proposal of the word "defined." The specification, however, discloses that clusters of subcarriers are "reconfigurable" and that cluster allocation can depend upon subcarrier-specific information \* \* \*

On balance, Defendants have failed to identify any reasonably clear definition of, or clear support for, the word "defined." As to Defendants' underlying argument that a cluster must be "defined" before it can be allocated . . . , Defendants have not proposed that the Court impose any required order of steps for the claims in which the disputed term appears. Nonetheless, the agreed-upon proposal that a cluster must be a "logical unit" suggests that the cluster must exist before it can be allocated. This requirement is also evident on the face of the claims, such as in the recital of "allocating at least one cluster in the one or more groups of clusters . . ." in above-quoted Claim 24 [of the '283 Patent]. Ultimately, the question of whether an accused instrumentality includes a "logical unit" of subcarriers (as opposed to a "random" collection of subcarriers, as Defendants have stated Plaintiff may rely upon) is a factual dispute regarding infringement rather than a legal dispute regarding claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) (noting that "the task of determining whether the construed claim reads on the accused product is for the finder of fact").

In sum, Defendants' proposal of "defined" is redundant and would tend to confuse rather than clarify the scope of the claims. Defendants' proposed construction is therefore rejected. The parties are otherwise in agreement as to the proper construction.

The Court accordingly hereby construes "cluster of subcarriers" to mean "logical unit of multiple physical subcarriers."

*Id.* at 84-85 (emphasis omitted).

In denying Defendants’ objections and motion for reconsideration in *Alcatel*, the Court found:

Defendants request clarification that subcarriers in a diversity cluster are chosen *because* they are relatively far apart. Similarly, Defendants request clarification that subcarriers in a coherence cluster are chosen *because* they are relatively close together.

\* \* \*

On balance, although Claim 1 requires at least one diversity cluster and at least one coherence cluster, Defendants have failed to justify importing a requirement that a base station must distinguish between these two types of clusters. Indeed, Claim 1 does not recite a base station. Instead, the method of Claim 1 demands only that at least one of each type of cluster is allocated. The state of mind of the base station, so to speak, is not a claim limitation.

Nonetheless, Defendants are correct that the “at least one diversity cluster” and the “at least one coherence cluster” must exist at the time of allocation, as opposed to being constructed or defined in hindsight. Because this is self-evident from the claim language, however, the Court need not modify or clarify the constructions of the disputed terms.

*Alcatel*, Dkt. No. 170 at 3-4.

As the Court noted, the specification discloses that clusters of subcarriers are “reconfigurable,” and cluster allocation can depend upon subcarrier-specific information. *See* ’172 Patent at 5:10-18 & 6:10-21; *see also Alcatel*, Dkt. No. 141 at 84 (quoted above).

Nonetheless, the Court also found that “the ‘at least one diversity cluster’ and the ‘at least one coherence cluster’ must exist at the time of allocation.” *Alcatel*, Dkt. No. 170 at 3-4.

Thus, a logical unit of multiple physical subcarriers must be allocated, and the allocated logical unit of multiple physical subcarriers must have existed as a particular logical unit prior to allocation.

Defendants’ proposal of clarifying the *Alcatel* constructions so as to refer to a logical unit “that exists at the time of allocation” is therefore appropriate. *See, e.g., GE Lighting Solutions*,

*LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1310 (Fed. Cir. 2014); *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009). Defendants’ proposal of the phrase “as opposed to being constructed or defined in hindsight,” however, is unnecessary in light of the Court adopting the phrase “that exists at the time of allocation.” Further, the negative limitation proposed by Defendants would tend to confuse rather than clarify the scope of the claims, in particular as to the meanings of the words “constructed” and “hindsight.”

The Court accordingly hereby construes the disputed terms as set forth in the following chart:

<u>Term</u>	<u>Construction</u>
<b>“diversity cluster of subcarriers”</b>  <b>“diversity cluster”</b>	<b>“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers that are relatively far apart, as compared to the subcarriers of a coherence cluster”</b>
<b>“coherence cluster”</b>	<b>“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers that are relatively close together, as compared to the subcarriers of a diversity cluster”</b>

#### **B. “coherence bandwidth”**

This term is no longer disputed and is not presented in the parties’ P.R. 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 51 at 2 n.4; *see also* Dkt. No. 60, Ex. A at 1-3. The Court therefore does not address this term.

### C. “reconfiguring cluster classification”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“changing the ratio of the number of diversity clusters to the number of coherence clusters”	“changing the ratio of the number of diversity clusters to the number of coherence clusters <i>available for selection by the base station</i> ”

Dkt. No. 60, Ex. A at 3 (emphasis added by the parties). The parties submit this term appears in Claim 9 of the ’172 Patent.

#### (1) The Parties’ Positions

Plaintiff submits that in *Alcatel* the parties agreed upon the construction Plaintiff now proposes here. Dkt. No. 46 at 8. As to Defendants’ present proposal, Plaintiff argues “[s]uch additional verbiage would result in an unneeded inconsistency when compared with [*Alcatel*].” *Id.* Plaintiff further argues: “It is clear from a non-limiting embodiment in the specification that the number of each type of cluster used, and accordingly the resulting ratio when changed (reclassified), can be based on the particular types of users (i.e. mobile or fixed) -- not on a particular number of clusters that are somehow ‘predefined’ and therefore ‘available for selection’ as proposed by the Defendants’ construction.” *Id.* (citing ’172 Patent at 16:56-63).

Defendants respond that “Defendants’ construction seeks to clarify that this limitation, like the cluster term itself, cannot be met by merely examining in hindsight different collections of subcarriers that were allocated to different users. Instead, because the clusters ‘must exist at the time of allocation as opposed to being constructed or defined in hindsight,’ it follows that the ratio of the number of diversity clusters to coherence clusters must also exist at the time of allocation.” Dkt. No. 51 at 7.

Plaintiff replies that the language proposed by Defendants is unnecessary because “their additional language tracks the limitations they seek to add to the terms ‘diversity’ and ‘coherence

cluster,’ which are being addressed separately in this process,” and “Defendants’ defeat a puzzling strawman argument that [Plaintiff’s] position ‘seeks to collapse the reconfiguration step into the ‘intelligent selection’ step.’” Dkt. No. 56 at 2.

## (2) Analysis

Claims 1 and 9 of the ’172 Patent recite (emphasis added)

1. A method for use in allocating subcarriers in an OFDMA system comprising allocating at least one diversity cluster of subcarriers to a first subscriber; and allocating at least one coherence cluster to a second subscriber, such that communication with the first and second subscribers is able to occur by simultaneously using the at least one diversity cluster and the at least one coherence cluster, respectively.

\* \* \*

9. The method defined in claim 1 further comprising *reconfiguring cluster classification* when population of mobile and fixed subscribers in a cell changes.

The specification discloses:

The ratio/allocation of the numbers of coherence and diversity clusters in a cell depends on the ratio of the population of mobile and fixed subscribers. When the population changes as the system evolves, *the allocation of coherence and diversity clusters can be reconfigured* to accommodate the new system needs. FIG. 12 illustrates a reconfiguration of cluster classification which can support more mobile subscribers than that in FIG. 9.

’172 Patent at 16:56-63 (emphasis added).

On balance, Defendants have not adequately justified introducing an “available for selection” limitation into above-quoted Claim 9. *See id.* at 16:18-29 & Fig. 11. Instead, the discussion of the “cluster” terms, above, adequately addresses that the clusters must exist as particular logical units of multiple physical subcarriers at the time of allocation.



The Court therefore hereby construes “**reconfiguring cluster classification**” to mean “**changing the ratio of the number of diversity clusters to the number of coherence clusters.**”

## V. CONSTRUCTION OF DISPUTED TERMS IN THE '808 PATENT

### A(i). “spatial signature”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“vector representing spatial characteristics of a channel”	<p>“vector(s) representing spatial characteristics of a channel including the extent to which existing spatial channels between respective subscribers and a base station interfere”</p> <p>Alternatively:  “vectors representing spatial characteristics of channels that can be used to determine the extent to which the existing spatial channels between respective subscribers and the base station interfere”</p>

Dkt. No. 60, Ex. A at 3-4; *see* Dkt. No. 68, 6/17/2015 Hr’g Tr. at 14:3-6. The parties submit this term appears in Claims 1, 2, 9, 13, 14, 31, 32, 34, and 41 of the ’808 Patent.

#### (1) The Parties’ Positions

Plaintiff proposes the *Alcatel* construction and submits that “[a] spatial signature provides information regarding the characteristics of what are known as spatial channels existing between different transmit antennas of a base station and receive antennas of subscribers.” Dkt. No. 46 at 10. Plaintiff also argues Defendants’ proposed construction should be rejected because “[t]he various embodiments in the ’808 specification make clear that when interference is determined, it is *determined from* (not represented by) the spatial signature.” *Id.* at 11 (citing ’808 Patent at 1:55-57 and 5:12-15). Further, Plaintiff argues, Defendants are “trying to engraft an SDMA-specific limitation onto claims that are clearly meant to encompass the broader category of

spatial multiplexing techniques generally, of which SDMA is but one example.” Dkt. No. 46 at 11 (citing ’808 Patent at 1:25-28 & 3:12-18); *see id.* at 1:25-28 (“space-division multiple-access (SDMA)”). Plaintiff explains that “[w]ith SDMA, separate spatial channels are allocated to respective different subscribers, whereas, with spatial multiplexing, more than one separate spatial channel may be allocated to the same subscriber.” Dkt. No. 46 at 11 n.10. Finally, Plaintiff argues claim differentiation as to Claims 15 and 25 of the ’808 Patent, which expressly recite SDMA limitations. *Id.* at 11.

Defendants respond that, as agreed by Plaintiff in the *Alcatel* claim construction proceedings, “spatial signatures necessarily represent characteristics that can be used to determine whether one subscriber’s channel interferes with another subscriber’s channel.” Dkt. No. 51 at 10. Defendants argue “[n]othing about Defendants’ construction mandates that the spatial signature must be used in an SDMA system. Rather, it merely recognizes what a spatial signature is, using language straight from the intrinsic evidence and, in particular, the precise language that [Plaintiff] represented as accurate to this Court in the [*Alcatel*] case.” *Id.* at 13. Nonetheless, Defendants assert “[t]he ’808 Patent . . . discloses no embodiments where two spatial channels are transmitted to the same subscriber.” *Id.*

Plaintiff replies that Defendants have cited Plaintiff’s reply brief in *Alcatel* out of context and, moreover, in *Alcatel* the Court considered and rejected the same argument. Dkt. No. 56 at 3-4. Plaintiff argues the “Farsakh” prior art reference cited by Defendants does not teach that spatial signatures are limited to representing direction of arrival of a signal. *See id.* at 4-5. Plaintiff also reiterates that base stations *use* spatial signatures to determine relevant information, but the spatial signatures do not themselves *represent* such information. *Id.* at 5. Further, Plaintiff reiterates that “[b]ecause the Defendants’ construction omits the single subscriber

spatial multiplexing scenario, it cannot be correct.” *Id.* at 6. Finally, Plaintiff submits “two closely spaced antennae [*sic*, antennas] on the same device could support nearly orthogonal spatial channels due to their different phase and amplitude characteristics. Thus, the patent does not exclude or teach away from single user spatial multiplexing.” *Id.* at 6-7.

At the June 17, 2015 hearing, Defendants urged that “no one is asking the Court to construe this term to require that SDMA must be performed,” but Defendants maintained that “[i]n the patent, the term ‘spatial multiplexing’ is used to refer to “SDMA.” Dkt. No. 68, 6/17/2015 Hr’g Tr. at 15:4-5 & 16:5-6. Plaintiff responded that “the ’808 patent deals with spatial signatures of antenna pairings. But it does not care, first, if those received antennas are on two different devices, which is SDMA, undoubtedly within the scope of the ’808 patent, or a single device with two antennas on that single device, which would be spatial multiplex[ing], again, also within the scope of the ’808 patent.” *Id.* at 33:5-11. Plaintiff also asserted the specification “shows other embodiments for spatial characteristics than just interference, such as using spatial characteristics to determine the achievable data rate or SINR of a particular subscriber.” *Id.* at 27:18-21.

## (2) Analysis

As to the purported concession in Plaintiff’s reply brief in *Alcatel*, Plaintiff’s brief stated:

Defendants’ constructions . . . erroneously require that the gains (purported to be the recited spatial signature) be of signals received by the base station.

Uplink channels carry data from a handset to the base station, while downlink channels carry data from the base station to the handset. For example, uploading a video to a social media site involves primarily an uplink communication, while streaming music to the handset involves primarily a downlink communication.

Defendants are distorting the meaning of the term “of a subscriber” as it is used in the claims. As the ’808 patent makes clear, the spatial characteristics of concern are not about a signal received from a subscriber, but rather are about the extent to

which existing *spatial channels* between respective subscribers and a basestation interfere, for purposes of OFDMA channel assignments.

*Alcatel*, Dkt. No. 128 at 15 (attached to Defendants' present response brief as Exhibit E). On its face, this statement does not amount to a concession that spatial signatures are necessarily for determining interference between multiple subscribers. Instead, Plaintiff referred to interference between spatial channels in general.

Defendants also argue spatial signatures are used for determining interference between multiple subscribers because "[w]hen the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question." *Microsoft v. Multi-Tech, Inc.*, 357 F.3d 1340, 1347 (Fed. Cir. 2004) (citation and internal quotation marks omitted).

The specification discloses, for example, that "[t]he level of interference between co-channel subscribers (sharing the same spectral resource, e.g., the same time slot/the same frequency/the same code (e.g., the spreading code)[]) is determined by the degree of orthogonality between their corresponding spatial signatures." '808 Patent at 5:12-16. As another example, the Background of the Invention notes:

Though intuitively promising, an obvious flaw of this scheme is that spatial channels are rarely orthogonal in practice. In other words, traffic over SDMA channels are mutually interfering. If multiple subscribers are assigned to one time slot without considering these spatial characteristics, the one with an unfavorable spatial configuration may experience significant throughput disadvantages.

*Id.* at 1:47-54; *see id.* at 1:25-28 ("One of the most aggressive ways of exploiting the spatial diversity is space-division multiple-access (SDMA), or spatial multiplexing, that attempts to multiply the throughput of a wireless network by introducing 'spatial channels.'") & 2:1-7 ("e.g., assigning the 'less-interfering' subscribers to the same time slot to increase the traffic

throughput”). The evidence cited by Defendants suggests that SDMA involves spatial multiplexing, and about this the parties do not appear to disagree. *See id.*; *see also* Dkt. No. 51, Ex. G, 9/11/2013 Cimini dep. at 377:19-378:18. Nonetheless, the presence of multiple subscribers is a particular application or a particular feature of a disclosed embodiment and should not be imported into the construction of the disputed terms. *See, e.g., Phillips*, 415 F.3d at 1323. Likewise, Defendants have cited the “Farsakh” reference that is cited in the ’808 Patent, but nothing in Farsakh or the discussion thereof warrants importing a multiple subscriber limitation. *See* ’808 Patent at 1:32-34 & 5:16-19.

Thus, on balance, Defendants have not adequately demonstrated any requirement of multiple subscribers. Finally, Defendants have not shown that spatial signatures must be used to determine interference. Instead, the specification refers also to “determin[ing] the achievable rate” and “determin[ing] the SINR”:

In responding to a link request from a new subscriber, or when the base-station has data to transmit to a standby subscriber, the logic first estimates the spatial signature of the corresponding subscriber over all, or a predetermined portion of OFDMA traffic channels. In one embodiment, the estimated information, along with the spatial characteristics of on-going subscribers are used to *determine the achievable rate* of the accessing subscriber over each of the OFDMA channels (with the presence of on-going SDMA subscribers). In an alternative embodiment, the estimated information and the spatial characteristics associated with on-going traffic channels are used to *determine the SINR* of the accessing subscriber over each of the OFDMA channels.

*Id.* at 6:33-45 (emphasis added); *see* Dkt. No. 45, Ex. A at 1 (parties agree that “SINRs” in the ’808 Patent means “signal-to-interference-plus-noise ratios”).

The Court therefore hereby construes “**spatial signature**” to mean “**vector representing spatial characteristics of a channel.**”

**A(ii). “spatial signature vectors”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“vectors representing spatial characteristics of channels”	“vector(s) representing spatial characteristics of a channel including the extent to which existing spatial channels between respective subscribers and a base station interfere”  Alternatively: “vectors representing spatial characteristics of channels that can be used to determine the extent to which the existing spatial channels between respective subscribers and the base station interfere”

Dkt. No. 60, Ex. A at 4-5; *see* Dkt. No. 68, 6/17/2015 Hr’g Tr. at 14:3-6. The parties submit that this term appears in Claims 1, 2, 13, and 14 of the ’808 Patent.

Plaintiff proposes the *Alcatel* construction and reiterates that Defendants are “trying to engraft an SDMA-specific limitation onto claims that are clearly meant to encompass the broader category of spatial multiplexing techniques generally, of which SDMA is but one example.”

Dkt. No. 46 at 12.

Defendants present the same arguments for this term as for “spatial signature,” addressed above. *See* Dkt. No. 51 at 9-15.

For the reasons set forth above as to the term “spatial signature,” the Court hereby construes **“spatial signature vectors”** to mean **“vectors representing spatial characteristics of channels.”**

**A(iii). “2-D spatial signatures,” “2-D spatial signature vectors,” and “broadband spatial signature vectors”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“two-dimensional matrices, or sets of vectors, that represent spatial characteristics of multiple channels”	“two-dimensional matrices, or sets of vectors, that represent spatial characteristics, including the extent to which existing spatial channels between respective subscribers and a base station interfere, of multiple channels”

Dkt. No. 60, Ex. A at 5-8. The parties submit these three terms appear in Claims 9, 34, and 41 of the ’808 Patent, Claims 13 and 14 of the ’808 Patent, and Claims 1, 2, and 13 of the ’808 Patent, respectively.

Plaintiff proposes the *Alcatel* construction, and the parties incorporate-by-reference their arguments as to “spatial signature,” which is addressed above. Dkt. No. 46 at 13; Dkt. No. 51 at 16; Dkt. No. 56 at 2 n.3.

For the reasons set forth above as to the term “spatial signature,” the Court hereby construes **“2-D spatial signatures,” “2-D spatial signature vectors,” and “broadband spatial signature vectors”** to mean **“two-dimensional matrices, or sets of vectors, that represent spatial characteristics of multiple channels.”**

**A(iv). “broadband spatial signature vectors associated with each subscriber” and “broadband spatial signature vectors of the subscribers”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
No construction necessary apart from separate construction of “broadband spatial signature vectors,” above.	No construction necessary apart from separate additional construction of “broadband spatial signature vectors,” above.

Dkt. No. 60, Ex. A at 8-10. The parties submit these terms appear in Claim 1 of the ’808 Patent and Claims 1 and 13 of the ’808 Patent, respectively.

Plaintiff proposes the *Alcatel* construction, and the parties incorporate-by-reference their arguments as to “spatial signature,” which is addressed above. Dkt. No. 46 at 13-14; Dkt. No. 51 at 16; Dkt. No. 56 at 2 n.3.

For the reasons set forth above as to the term “spatial signature,” the Court hereby finds that for **“broadband spatial signature vectors associated with each subscriber”** and **“broadband spatial signature vectors of the subscribers”**: No construction necessary apart from separate construction of **“broadband spatial signature vectors.”**

A(v). **“2-D spatial signatures of an accessing subscriber and one or more subscribers with on-going traffic,” “2-D spatial signature vectors of the new subscriber and other subscribers with on-going traffic,” and “2-D spatial signatures of the new subscriber and one or more subscribers with on-going traffic”**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary apart from the separate construction of “2-D spatial signatures,” above.	No construction necessary apart from separate additional construction of “2-D spatial signature vectors,” above.

Dkt. No. 60, Ex. A at 10-12. The parties submit these three terms appear in Claim 9 of the ’808 Patent, Claim 14 of the ’808 Patent, and Claim 41 of the ’808 Patent, respectively.

Plaintiff proposes the *Alcatel* construction, and the parties incorporate-by-reference their arguments as to “spatial signature,” which is addressed above. Dkt. No. 46 at 14; Dkt. No. 51 at 17; Dkt. No. 56 at 2 n.3.

For the reasons set forth above as to the term “spatial signature,” the Court hereby finds that for **“2-D spatial signatures of an accessing subscriber and one or more subscribers with on-going traffic,” “2-D spatial signature vectors of the new subscriber and other subscribers with on-going traffic,” and “2-D spatial signatures of the new subscriber and one or more subscribers with on-going traffic”**: No construction necessary apart from the separate construction of **“2-D spatial signatures.”**



**A(vi). “new accessing subscriber spatial signature” and “new subscriber spatial signature”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
No construction necessary apart from the separate constructions of “spatial signature,” “new subscriber,” and “new accessing subscriber.”	No construction necessary apart from separate additional construction of “spatial signature,” above.

Dkt. No. 60, Ex. A at 13-14. The parties submit these terms appear in Claims 31, 32, and 34 of the ’808 Patent and Claim 32 of the ’808 Patent, respectively.

Plaintiff proposes the *Alcatel* construction, and the parties incorporate-by-reference their arguments as to “spatial signature,” which is addressed above. Dkt. No. 46 at 15; Dkt. No. 51 at 18; Dkt. No. 56 at 2 n.3.

For the reasons set forth above as to the term “spatial signature,” the Court hereby finds that for **“new accessing subscriber spatial signature” and “new subscriber spatial signature”**: **No construction necessary apart from the separate constructions of “spatial signature,” “new subscriber,” and “new accessing subscriber.”** *See* Dkt. No. 45, Ex. A (setting forth agreed-upon constructions for “new subscriber” and “new accessing subscriber”).

**A(vii). “on-going traffic spatial signature”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
No construction necessary apart from the separate constructions of “spatial signature” and “subscribers with on-going traffic.”	No construction necessary apart from separate additional construction of “spatial signature,” above.

Dkt. No. 60, Ex. A at 14-15. The parties submit this term appears in Claims 31, 32, and 34 of the ’808 Patent.

Plaintiff proposes the *Alcatel* construction, and the parties incorporate-by-reference their arguments as to “spatial signature,” which is addressed above. Dkt. No. 46 at 15-16; Dkt. No. 51 at 18; Dkt. No. 56 at 2 n.3.

For the reasons set forth above as to the term “spatial signature,” the Court hereby finds that for **“on-going traffic spatial signature”**: **No construction necessary apart from the separate construction of “spatial signature.”**

**B. “on-going traffic” and “subscribers with on-going traffic”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“subscribers that have been allocated traffic channels and that have on-going traffic”	“subscribers that have been allocated traffic channels for use on an on-going basis”

Dkt. No. 45, Ex. D at 20; Dkt. No. 46 at 16. The parties submit these terms appear in Claims 9, 14, 31, 32, 34, and 41 of the ’808 Patent and Claims 9, 14, and 41 of the ’808 Patent, respectively.

Plaintiff proposes the *Alcatel* construction and argues: “First, the term ‘on-going traffic’ has a distinct meaning from the term ‘subscribers’, since such traffic may or may not involve subscribers. Second, . . . Defendants are improperly attempting to convert on-going traffic into on-going use of allocated channels.” Dkt. No. 46 at 17-18 (footnote omitted); *see id.* at 16.

The terms “on-going traffic” and “subscribers with on-going traffic” appear in Defendants’ exhibit to the parties’ P.R. 4-3 Joint Claim Construction and Prehearing Statement. *See* Dkt. No. 45, Ex. D at 18 & 20. Defendants have not addressed these purportedly disputed terms in their response brief, and these terms do not appear as distinct disputed terms in the parties’ P.R. 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 60 at Ex. A. The Court therefore does not address these terms. *See CardSoft, LLC v. VeriFone, Inc.*, 769 F.3d 1114, 1119 (Fed. Cir. 2014) (“Arguments that are not appropriately developed in a party’s briefing may be deemed waived.”).

**C.(i) “new accessing subscriber spatial signature register” and “new subscriber spatial signature register”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
Plain meaning	“register for storing ‘new accessing subscriber spatial signatures,’ but not ‘on-going traffic spatial signatures’”

Dkt. No. 60, Ex. A at 15-16. The parties submit these terms appear in Claims 31, 32, and 34 of the ’808 Patent and Claim 32 of the ’808 Patent, respectively.

(1) The Parties’ Positions

Plaintiff proposes the *Alcatel* construction and argues “Defendants’ proposed construction is incorrect because there is no requirement in the specification that a register be used solely for storing only ‘new accessing subscriber spatial signatures’ or that registers for new subscribers be completely separate and distinct from registers for subscribers with on-going traffic.” Dkt. No. 46 at 18.

Defendants respond that the Court in *Alcatel* found, and the specification supports, “there must be some organization or division between each type of register.” Dkt. No. 51 at 19.

Plaintiff replies that in light of the Court’s findings in *Alcatel*, no further construction of these disputed terms is necessary. Dkt. No. 56 at 7-8.

(2) Analysis

Claims 31, 32, and 34 of the ’808 Patent recite (emphasis added):

31. A base station comprising:  
a plurality of receiving antennas;  
a plurality of down converters coupled to the plurality of receiving antennas;  
a *new accessing subscriber spatial signature register*;  
an *on-going traffic spatial signature register*; and  
an OFDMA traffic channel allocator coupled to the *new accessing subscriber spatial signature register* and the *on-going traffic spatial signature register*.

32. The base station defined in claim 31 wherein the channel allocation logic allocates OFDMA channels to a new subscriber based on information from the *new subscriber spatial signature register* and the *on-going traffic spatial signature register*.

\* \* \*

34. The base station defined in claim [3]1<sup>4</sup> wherein the *new accessing subscriber spatial signature register* and the *on-going traffic spatial signature register* store 2-D spatial signatures.

In *Alcatel*, the Court noted that “distinctly recited limitations are usually interpreted as distinct structures” (citing *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)), and the Court found:

On balance, Defendants have failed to demonstrate that a register can store only one type of data at a time, i.e., either “new” subscriber spatial signatures or “on-going” subscriber spatial signatures. Instead, as Plaintiff has argued, a single structure could be organized or subdivided so as to constitute both a “new subscriber spatial signature register” and an “on-going traffic spatial signature register.” Defendants’ proposed constructions are therefore hereby expressly rejected.

*Alcatel*, Dkt. No. 141 at 73-74; *see also id.* (discussing ’808 Patent at 7:26-35 & Figs. 5 & 6).

The Court reaches the same conclusion here and hereby expressly rejects Defendants’ proposed construction. Nonetheless, the parties briefing demonstrates a dispute as to the meaning of these terms, and clarification of the constructions is appropriate to more clearly reflect the Court’s above-quoted findings. *See, e.g., GE Lighting*, 750 F.3d at 1310.

The Court accordingly hereby construes the disputed terms as set forth in the following chart:

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<sup>4</sup> This correction from “1” to “31” is set forth in a Certificate of Correction attached to the ’808 Patent. *See* Dkt. No. 46, Ex. B at p. 18 of 18.

<u>Term</u>	<u>Construction</u>
<b>“new accessing subscriber spatial signature register”</b>	<b>“a register, or a subdivision of a register, that stores one or more new accessing subscriber spatial signatures”</b>
<b>“new subscriber spatial signature register”</b>	<b>“a register, or a subdivision of a register, that stores one or more new subscriber spatial signatures”</b>

**C.(ii) “on-going traffic spatial signature register”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
Plain meaning	“register for storing ‘on-going traffic spatial signatures,’ but not ‘new accessing subscriber spatial signatures’”

Dkt. No. 60, Ex. A at 16. The parties submit this term appears in Claims 31, 32, and 34 of the ‘808 Patent.

Plaintiff proposes the *Alcatel* construction and presents similar arguments as for “new accessing subscriber spatial signature register” and “new subscriber spatial signature register,” which are addressed above. *See* Dkt. No. 46 at 20-21.

Defendants respond by incorporating-by-reference their arguments as to “new accessing subscriber spatial signature register” and “new subscriber spatial signature register,” which are addressed above. Dkt. No. 51 at 20. Plaintiff replies likewise. Dkt. No. 56 at 7 n.4.

For the same reasons set forth above as to the terms “new accessing subscriber spatial signature register” and “new subscriber spatial signature register,” the Court hereby construes **“on-going traffic spatial signature register”** to mean **“a register, or a subdivision of a register, that stores one or more on-going traffic spatial signatures.”**

**D. “an OFDMA traffic channel allocator”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“logic configured to allocate OFDMA traffic channels”	“logic configured to allocate OFDMA traffic channels based on two-dimensional spatial signatures”

Dkt. No. 60, Ex. A at 17. The parties submit this term appears in Claim 31 of the ’808 Patent.

(1) The Parties’ Positions

Plaintiff proposes the *Alcatel* construction and argues Defendants’ proposal is unsupported by the claim language and “would effectively collapse claims 31, 32, and 34 into a single claim.” Dkt. No. 46 at 21.

Defendants respond that “the patentee clearly and unmistakably argued that ‘the channel assignment of the present invention is claimed as based on two-dimensional (matrix) spatial signature,’ as opposed to the Yun reference that purportedly used a one dimensional spatial signature.” Dkt. No. 51 at 21 (quoting *id.*, Ex. J, 7/19/2004 Amendment and Response to Office Action at 15-16). Defendants conclude that “[t]he doctrine of claim differentiation is plainly inapplicable here, in the face of clear and unmistakable prosecution history waiver.” Dkt. No. 51 at 22.

Plaintiff replies that Defendants’ disclaimer argument “was already considered and rejected in the [*Alcatel*] case in the context of ‘spatial signatures’ and it should be rejected for the same reasons here.” Dkt. No. 56 at 8.

At the June 17, 2015 hearing, Defendants clarified that their proposal of “based on two-dimensional spatial signatures” “is in the plural . . . because ‘channels’ is in the plural. It’s not our suggestion here that for any given channel you must use multiple . . . 2-D spatial signatures.”

See Dkt. No. 68, 6/17/2015 Hr'g Tr. at 46:16-21. Defendants maintained the prosecution history requires that at least one two-dimensional spatial signature must be used. See *id.* at 46:22-24.

(2) Analysis

In the prosecution history at issue, the patentee distinguished the “Yun” reference by stating as follows:

The Examiner rejected Claims 1-12, 15, 21, 22, and 27 under 35 U.S.C. §103(a) as being unpatentable over Yun et al. in view of Alamouti et al. Yun discloses a conventional FDMA system. The Examiner recognizes that Yun fails to disclose the use of the OFDMA protocol. However, the Examiner believes it was well known in the art that OFDMA protocols are an improvement over FDMA protocols and cited Alamouti to teach the use of OFDMA protocols. The Examiner believes that it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the use of OFDMA as taught by Alamouti into Yun. Applicants respectfully disagree.

FDMA is fundamentally different than the OFDMA protocol. In OFDMA, each subscriber can occupy an arbitrary number of subcarriers of the entire channel bandwidth, while in FDMA, each subscriber is assigned to only one voice channel. In other words, each assignment decision in Yun is made based on a one-dimensional spatial signature, while [a] *spatial signature in OFDMA is two-dimensional* (e.g., a matrix or vector). Thus, *the channel assignment decision of the present invention is claimed as based on [a] two-dimensional (matrix) spatial signature*, which is much more difficult than a narrow band case (e.g., TDMA, CDMA, FDMA). Applicants respectfully submit that this feature is set forth in the claims since *OFDMA channels are already specified in the claims*. Even so, Applicants have amended claims 11 and 14 and added claims 36, 41, and 43 to explicitly set forth the two-dimensional nature of the spatial signatures.

Therefore, in view of this, Applicants respectfully submit that the present invention as claimed in Claims 1-12, 15, 21, 22, and 27 is not obvious in view of the combination of Yun and Alamouti.

Dkt. No. 51, Ex. J, 7/14/2004 Amendment and Response to Office Action at 15-16 (emphasis added).<sup>5</sup>

In *Alcatel* the Court considered the prosecution history Defendants have cited here, but the Court did so in relation to a different dispute. Specifically, the Court ruled:

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<sup>5</sup> Application claim 21 issued as Claim 31. See *id.*, Ex. K, 11/5/2004 Issue Classification.

[T]his prosecution history is not definitive regarding the construction of “spatial signature” because the patentee explained that “OFDMA channels are already specified in the claims.” That is, the patentee explained that the two-dimensional nature of OFDMA is specified by other claim language where applicable. Defendants’ reliance on the prosecution history for a narrower construction of ‘spatial signature’ as to Claim 31 is . . . hereby expressly rejected.

*Alcatel*, Dkt. No. 141 at 57 (citation omitted). In other words, the Court found spatial signatures in general are not necessarily “two-dimensional.” Nonetheless, the patentee stated a “spatial signature in OFDMA is two-dimensional.” Dkt. No. 51, Ex. J, 7/14/2004 Amendment and Response to Office Action at 15.

The remaining issue, then, is whether an “OFDMA traffic channel allocator” must allocate traffic channels based on a spatial signature. In *Alcatel*, the Court found that “although Claim 31 recites that the OFDMA traffic channel allocator must be ‘coupled’ to two spatial signature registers, Claim 31 does not specify that the allocator must allocate based on 2-D spatial signatures of *multiple* subscribers.” *Alcatel*, Dkt. No. 141 at 80 (emphasis added). The Court in *Alcatel* therefore rejected the Defendants’ proposal that the disputed term be construed to mean “logic configured to allocate OFDMA traffic channels to a subscriber using 2-D spatial signatures of *multiple* subscribers.” *Id.* at 79 (emphasis added).

Claims 31, 32, and 34 of the ’808 Patent recite (emphasis added):

31. A base station comprising:
  - a plurality of receiving antennas;
  - a plurality of down converters coupled to the plurality of receiving antennas;
  - a new accessing subscriber spatial signature register;
  - an on-going traffic spatial signature register; and
  - an *OFDMA traffic channel allocator* coupled to the new accessing subscriber spatial signature register and the on-going traffic spatial signature register.
32. The base station defined in claim 31 wherein the channel allocation logic allocates OFDMA channels to a new subscriber based on information from the



new subscriber spatial signature register and the on-going traffic spatial signature register.

\* \* \*

34. The base station defined in claim [3]1<sup>6</sup> wherein the new accessing subscriber spatial signature register and the on-going traffic spatial signature register store 2-D spatial signatures.

Plaintiff has cited the doctrine of claim differentiation as demonstrating that the “OFDMA traffic channel allocator” is not limited to allocating “based on” spatial signatures and is not limited to using “2-D” spatial signatures. *See, e.g., Phillips*, 415 F.3d at 1315 (“the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim”); *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182 (Fed. Cir. 1998) (“the doctrine of claim differentiation states the presumption that the difference between claims is significant”) (quoting *Tandon Corp. v. United States Int’l Trade Comm’n*, 831 F.2d 1017, 1023 (Fed. Cir. 1987)).

Claim differentiation, however, cannot “broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence.” *Seachange Int’l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1369 (Fed. Cir. 2005) (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998)).

Here, as quoted above, in distinguishing the Yun reference from the claim that issued as Claim 31 (among others), the patentee definitively stated that a “spatial signature in OFDMA is two-dimensional (e.g., a matrix or vector). Thus, the channel assignment decision of the present invention is claimed as based on [a] two-dimensional (matrix) spatial signature, which is much more difficult than a narrow band case (e.g., TDMA, CDMA, FDMA).” Dkt. No. 51, Ex. J,

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<sup>6</sup> This correction from “1” to “31” is set forth in a Certificate of Correction attached to the ’808 Patent. *See* Dkt. No. 46, Ex. B at p. 18 of 18.

7/14/2004 Amendment and Response to Office Action at 15-16. Also of note, the patentee stated that “this feature is set forth in the claims since OFDMA channels are already specified in the claims” (*id.* at 16), and the disputed term “OFDMA traffic channel allocator” is the only instance of “OFDMA” recited in Claim 31.

These definitive statements by the patentee should be given effect in the Court’s construction. *See Omega Eng’g v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public’s reliance on definitive statements made during prosecution.”); *see also Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1381 (Fed. Cir. 2011) (“The patentee is bound by representations made and actions that were taken in order to obtain the patent.”); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995) (“Claims may not be construed one way in order to obtain their allowance and in a different way against accused infringers.”).

The Court accordingly rejects Plaintiff’s claim differentiation arguments. *See Seachange*, 413 F.3d at 1369. Nonetheless, to whatever extent Defendants are proposing that an “OFDMA traffic channel allocator” must allocate channels based on multiple two-dimensional spatial signatures,” the above-quoted prosecution history relied upon by Defendants supports a disclaimer only so as to require use of at least one two-dimensional spatial signature.

The Court accordingly hereby construes **“an OFDMA traffic channel allocator”** to mean **“logic configured to allocate OFDMA traffic channels based on one or more two-dimensional spatial signatures.”**

**E. “subscriber units to communicate with the base station using an orthogonal frequency-division multiple-access (OFDMA) protocol”**

This term is no longer disputed and is not presented in the parties’ P.R. 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 51 at 2 n.4; *see also* Dkt. No. 60, Ex. A at 3-18. The Court therefore does not address this term.

**F. “OFDMA traffic channel”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
Plain meaning	“one or more physical OFDM subcarriers assigned to a particular subscriber to carry information between the base station and subscriber”  Alternatively: “one or more physical OFDM subcarriers assigned to one or more subscribers to carry information between the base station and subscriber”

Dkt. No. 60, Ex. A at 17-18; *see* Dkt. No. 68, 6/17/2015 Hr’g Tr. at 36:15-37:5. The parties submit this term appears in Claim 31 of the ’808 Patent.

(1) The Parties’ Positions

Plaintiff notes this term was not construed in *Alcatel* or in the litigation in the Northern District of California. Dkt. No. 46 at 24. Plaintiff also urges that “[t]he jury will readily comprehend that an ‘OFDMA traffic channel’ is a traffic channel that can be used to carry traffic using OFDMA.” *Id.*

Defendants respond that the specification defines what the traffic channel is in an OFDMA embodiment. Dkt. No. 51 at 23. Defendants argue construction is appropriate because, in the *Alcatel* case, “[Plaintiff] is contending that an OFDMA traffic channel covers some clusters of OFDM sub-carriers, but not all clusters of OFDM subcarriers. In particular,

[Plaintiff's expert] argues that the term is limited only to those clusters of OFDM subcarriers that carry user traffic, as opposed to control traffic.” *Id.* (citing *id.*, Ex. L at 5-6). Defendants conclude that “[w]hile the patent specification clearly explains that an OFDMA traffic channel (regardless of what traffic it carries) is defined by *the one or more OFDM subcarriers used for transmission by a particular subscriber*, there is *no* embodiment described in the specification that limits OFDMA traffic channels to particular types of traffic (user versus control).” Dkt. No. 51 at 23-24.

Plaintiff replies that “Defendants convert OFDMA into OFDM even though these are very different terms,” and Defendants’ proposal is unclear if it “requires the same subcarriers to carry information to and from the base station and subscriber.” Dkt. No. 56 at 9.

At the June 17, 2015 hearing, Defendants urged construction is necessary to reject Plaintiff’s incorrect interpretation that, in Defendants’ words, “sometimes those [OFDM subcarriers] are traffic channels and sometimes they’re not depending on what kind of information they carry.” Dkt. No. 68, 6/17/2015 Hr’g Tr. at 37:19-23; *see id.* at 41:23-25 (“A traffic channel is the subcarriers that make up the channel; it’s not the kind of information that’s being transmitted.”). Finally, as to Plaintiff’s above-noted concern in its reply brief as whether Defendants are attempting to require a particular direction of communication, Defendants stated that “there’s no intent to interpret it that way. We’re not talking about only going to the base station or only going to the subscriber.” *Id.* at 43:13-16.

## (2) Analysis

In United States Patent No. 7,072,315 (“’315 Patent”), which was construed in *Alcatel* but which is not asserted in the present case, the specification states that “[i]n OFDMA, one or a cluster of OFDM sub-carriers defines a ‘traffic channel’ . . . .” ’315 Patent at 1:54-58. Also, the

'283 Patent discloses that “the base station notifies the subscriber about the cluster allocation through a downlink common control channel *or through a dedicated downlink traffic channel* if the connection to the subscriber has already been established.” '283 Patent at 6:30-34 (emphasis added); *see id.* at 6:37-39 (“each subscriber can . . . send . . . feedback to the base station using a dedicated traffic channel”). The '808 Patent discloses that “each traffic channel is a cluster of OFDM sub-carriers . . . .” '808 Patent at 3:25-26. Defendants have also cited similar testimony by one of Plaintiff's experts. Dkt. No. 51, Ex. G, 9/11/2013 Cimini dep. at 380:2-9.

On balance, however, Defendants have not adequately demonstrated that construction is appropriate. Plaintiff's position in the present litigation is that the plain meaning of “OFDMA traffic channel” is “a traffic channel that can be used to carry traffic using OFDMA.” Dkt. No. 46 at 24. To whatever extent, if any, Plaintiff has taken a contrary position in other litigation, claim construction in the above-captioned case is not an appropriate vehicle for resolving any such dispute.

The Court therefore hereby expressly rejects Defendants' proposed construction. No further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) (“Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.”); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (“[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims.”); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) (“Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.”).

The Court accordingly hereby construes “**OFDMA traffic channel**” to have its **plain meaning**.

**G. “down converter”**

This term is no longer disputed and is not presented in the parties’ P.R. 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 51 at 2 n.4; *see also* Dkt. No. 60, Ex. A at 3-18. The Court therefore does not address this term.

**H. “OFDMA”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“Orthogonal frequency division multiple access”	“a multiple access scheme in which channels are distinguished by frequency and the frequencies are orthogonal”

Dkt. No. 60, Ex. A at 18. The parties submit this term appears in Claims 1, 9, 14, 31, 32, and 41 of the ’808 Patent.

(1) The Parties’ Positions

Plaintiff submits that in *Alcatel* the parties agreed upon the construction Plaintiff now proposes here, and Plaintiff argues “[a]s OFDMA is expressly defined in the specification, the Court will not err by adopting such definition.” Dkt. No. 46 at 27.

Defendants respond that, in *Alcatel*,<sup>7</sup> “[Plaintiff’s] expert (under the guise of the ‘ordinary meaning’ of OFDMA) is attempting to import into that term several details that are, at best, optional features of OFDMA systems and, in some cases, flatly contradict the patents in suit.” Dkt. No. 51 at 24. “At best,” Defendants argue, “[Plaintiff’s] attempts to limit OFDMA . . . is an attempt to import preferred embodiments . . . .” *Id.* at 25.

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<sup>7</sup> More specifically, Defendants refer to Civil Action No. 6:12-CV-369. Dkt. No. 51 at 24.

Plaintiff replies that “Defendants mischaracterize a background section in Dr. Wells’ Rebuttal Invalidity Report, comparing OFDMA to other access techniques, as somehow trying to limit the definition. None of their citations actually come from his analyzing the claim terms against the prior art.” Dkt. No. 56 at 9-10.

At the June 17, 2015 hearing, Plaintiff submitted that, as the Court found in *Alcatel*, any disputes about the inherent qualities of OFDMA are factual disputes regarding infringement rather than legal disputes for claim construction. *See* Dkt. No. 68, 6/17/2015 Hr’g Tr. at 58:1-8 (citing *PPG*, 156 F.3d at 1355).

Defendants responded by urging that “[t]he meaning of ‘OFDMA’ is a legal issue and it should be decided by the Court.” Dkt. No. 68, 6/17/2015 Hr’g Tr. at 61:15-17. Defendants explained:

[T]hey’ve argued that a system that supports fixed but not mobile subscribers can’t be OFDMA. They’ve said that a system that can’t assign more than one channel to a given subscriber, that can’t be OFDMA. They said that a system that can communicate voice but not data can’t be OFDMA. And systems that can’t dynamically increase bandwidth allocations can’t be OFDMA. And systems that cannot perform real-time channel allocations can’t be OFDMA.

Defendants don’t believe any of these qualities are inherent to the OFDMA systems, and that the Court should explicitly reject any attempt to distinguish prior art on this basis. And this is a legal issue.

*Id.* at 62:11-22.

Plaintiff replied that its expert “was simply explaining that [*sic*] the inherent capabilities of OFDMA systems, such as what OFDMA enables, not what it requires.” *Id.* at 66:5-7.

## (2) Analysis

In *Alcatel*, the parties agreed “OFDMA” means “orthogonal frequency division multiple access.” *Alcatel*, Dkt. No. 141 at 8. Indeed, the Summary of the Invention of the ’808 Patent

refers to “an orthogonal frequency-division multiple-access (OFDMA) protocol.” ’808 Patent at 2:36-37; *see id.* at 5:44-49; *see also* ’283 Patent at 1:18-23 & 1:34-39.

On balance, Defendants have not adequately demonstrated that additional construction is necessary. Even assuming for the sake of argument that claim construction is an appropriate mechanism for resolving any disputes as to the meaning of “orthogonal frequency division multiple access” in the relevant art, claim construction in the above-captioned case is not an appropriate vehicle for resolving any such disputes that may have arisen in other litigation.<sup>8</sup>

The Court therefore hereby construes **“OFDMA”** to mean **“orthogonal frequency division multiple access.”**

## VI. CONSTRUCTION OF DISPUTED TERMS IN THE ’283 PATENT

All of the disputed terms in the ’283 Patent appear in Claim 92. Dkt. No. 51 at 28.

### A. “cluster of subcarriers”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“logical unit of multiple physical subcarriers”	“logical unit of multiple physical subcarriers existing at the time of allocation, as opposed to being constructed or defined in hindsight”

Dkt. No. 60, Ex. A at 20.

Plaintiff proposes the *Alcatel* construction and submits that in *Alcatel* the Court rejected the temporal limitation that Defendants are proposing here. Dkt. No. 46 at 28. Defendants respond by incorporating-by-reference their arguments as to the “cluster” terms in the ’172 Patent, which are addressed above. Dkt. No. 51 at 29.

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<sup>8</sup> The Court need not reach Plaintiff’s argument that Defendants should be estopped from here proposing a construction different from the agreed-upon construction in *Alcatel*. *See* Dkt. No. 46 at 27 n.16.



For the same reasons set forth above as to the terms “diversity cluster of subcarriers,” “diversity cluster,” and “coherence cluster” in the ’172 Patent, the Court hereby construes **“cluster of subcarriers”** to mean **“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers.”**

**B. “allocating additional clusters to the subscriber”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
Plain meaning	“allocating more clusters to the subscriber beyond those currently allocated to the subscriber”

Dkt. No. 45, Ex. D at 32; Dkt. No. 46 at 28.

Plaintiff proposes the *Alcatel* construction and submits that in *Alcatel* the Court rejected the language now proposed by Defendants. Dkt. No. 46 at 28; *see Alcatel*, Dkt. No. 141 at 90-94.

The term “allocating additional clusters to the subscriber” appears in Defendants’ exhibit to the parties’ P.R. 4-3 Joint Claim Construction and Prehearing Statement. *See* Dkt. No. 45, Ex. D at 32. Defendants have not addressed this purportedly disputed term in their response brief, and this term does not appear as a distinct disputed term in the parties’ 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 60 at Ex. A. The Court therefore does not address this term. *See CardSoft*, 769 F.3d at 1119.

**C. “a system employing orthogonal frequency division multiple access (OFDMA)”**

This term is no longer disputed and is not presented in the parties’ P.R. 4-5(d) Joint Claim Construction Chart. *See* Dkt. No. 51 at 2 n.4; *see also* Dkt. No. 60, Ex. A at 3-18. The Court therefore does not address this term.

**D. “a plurality of groups of at least one cluster of subcarriers”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
Plain meaning	“more than one group where each group includes one or more clusters of subcarriers”

Dkt. No. 60, Ex. A at 21.

(1) The Parties’ Positions

Plaintiff argues that “[n]either this Court nor the Northern District of California has construed this term,” and “[Plaintiff] sees no sense in Defendants’ re-wording of the claim language.” Dkt. No. 46 at 30.

Defendants respond that construction is necessary because “[Plaintiff] has revealed in the [Alcatel] case . . . that it plans through its expert, Dr. Jonathan Wells, to argue that claim language clearly stating ‘one or more cluster’ should be interpreted to mean ‘at least two clusters.’” Dkt. No. 51 at 29 (citing *id.*, Ex. D, 9/30/2014 Wells dep. at 253:22-258:2).

Plaintiff replies: “The Defendants justify rewording the claim based on one deposition cite of [Plaintiff’s] expert. The claim language is unambiguous and needs no further construction.” Dkt. No. 56 at 10.

At the June 17, 2015 hearing, Defendants argued with reference to Claim 92 that “[t]here’s nothing here changing what the groups are. We know from the antecedent basis that the groups have at least one cluster.” Dkt. No. 68, 6/17/2015 Hr’g Tr. at 75:20-22. Plaintiff responded that “even if Your Honor were to accept Defendants’ proposed construction, we just want to make something very clear, that this should not -- the construction should only apply to the first time in Claim 92 of the ’283 patent that you see this term appear.” *Id.* at 78:19-23. Defendants replied that “Defendants do request that the Court find that the later limitations refer

back to the first limitation and that there's nothing later in the claim that changes the meaning of 'the groups' that were defined in [the first element]." *Id.* at 79:16-19.

(2) Analysis

Claim 92 of the '283 Patent recites (emphasis added):

92. A method for subcarrier selection for a system employing orthogonal frequency division multiple access (OFDMA) comprising:  
    partitioning subcarriers into a *plurality of groups of at least one cluster of subcarriers*; and  
    receiving an indication of a selection by a subscriber of one or more groups in the plurality of groups;  
    allocating at least one cluster in the one or more groups of clusters selected by the subscriber for use in communication with the subscriber;  
    receiving additional feedback information on the one or more groups of clusters; and  
    allocating additional clusters to the subscriber.

The claim language is sufficiently clear on its face, and Defendants have not demonstrated that construction is necessary. To whatever extent, if any, Plaintiff has taken a position in other litigation that is contrary to the plain language of the claim, claim construction in the above-captioned case is not an appropriate vehicle for resolving any such dispute.

The Court therefore hereby expressly rejects Defendants' proposed construction. No further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568; *see also O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207.

The Court accordingly hereby construes **"a plurality of groups of at least one cluster of subcarriers"** to have its **plain meaning**.

**E. “OFDMA”**

<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“Orthogonal frequency division multiple access”	“a multiple access scheme in which channels are distinguished by frequency and the frequencies are orthogonal”

Dkt. No. 60, Ex. A at 19.

Plaintiff submits: “This term has been addressed above in connection with the ’808 patent. To avoid repetition, [Plaintiff] incorporates that argument herein by reference.” Dkt. No. 46 at 30. Defendants respond by incorporating-by-reference their arguments as to the same term in the ’808 Patent. Dkt. No. 51 at 30. Plaintiff replies likewise. Dkt. No. 56 at 9 n.5.

For the same reasons set forth above as to the same term in the ’808 Patent, the Court hereby construes **“OFDMA”** to mean **“orthogonal frequency division multiple access.”**

**VII. CONCLUSION**

The Court hereby orders the claim terms addressed herein construed as indicated. Summary charts are attached below as Exhibit A (agreed terms) and Exhibit B (disputed terms).

The parties are further ordered that they may not refer, directly or indirectly, to each other’s claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual constructions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the constructions adopted by the Court.

**SIGNED this 22nd day of July, 2015.**

  
CAROLINE M. CRAVEN  
UNITED STATES MAGISTRATE JUDGE

## EXHIBIT A

Agreed Claim Term	Patent / Claims	Court's Construction
"SINRs"	'808 Pat., Cls. 9, 41	"Signal-to-Interference-plus-Noise Ratios"
"new subscriber"	'808 Pat., Cls. 14, 32, 41	"subscriber that has requested access but has not been assigned a traffic channel"
"accessing subscriber"	'808 Pat., Cls. 9, 31, 34	"subscriber that has requested access but has not been assigned a traffic channel"
"new accessing subscriber"	'808 Pat., Cls. 31, 34	"subscriber that has requested access but has not been assigned a traffic channel"
"allocate OFDMA channels using the broadband spatial signature vectors of the subscribers"	'808 Pat., Cl. 1	"allocate each of multiple OFDMA channels using more than one subscriber's broadband spatial signature vectors"
"selection" / "selected"	'283 Pat., Cl. 92	"choice" / "chosen"
"SINR"	'283 Pat., Cl. 101	"Signal-to-Interference-plus-Noise Ratio"
"a group identifier"	'283 Pat., Cl. 102	"one or more data bits that identify the group"

## EXHIBIT B

United States Patent No. 7,146,172	
<u>Disputed Claim Term</u>	<u>Court's Construction</u>
<b>“diversity cluster of subcarriers”</b> <b>“diversity cluster”</b>	<b>“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers that are relatively far apart, as compared to the subcarriers of a coherence cluster”</b>
<b>“coherence cluster”</b>	<b>“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers that are relatively close together, as compared to the subcarriers of a diversity cluster”</b>
<b>“reconfiguring cluster classification”</b>	<b>“changing the ratio of the number of diversity clusters to the number of coherence clusters”</b>
United States Patent No. 6,870,808	
<u>Disputed Claim Term</u>	<u>Court's Construction</u>
<b>“spatial signature”</b>	<b>“vector representing spatial characteristics of a channel”</b>
<b>“spatial signature vectors”</b>	<b>“vectors representing spatial characteristics of channels”</b>
<b>“2-D spatial signatures”</b> <b>“2-D spatial signature vectors”</b> <b>“broadband spatial signature vectors”</b>	<b>“two-dimensional matrices, or sets of vectors, that represent spatial characteristics of multiple channels”</b>
<b>“broadband spatial signature vectors associated with each subscriber”</b> <b>“broadband spatial signature vectors of the subscribers”</b>	<b>No construction necessary apart from separate construction of “broadband spatial signature vectors.”</b>

<p><b>“2-D spatial signatures of an accessing subscriber and one or more subscribers with on-going traffic”</b></p> <p><b>“2-D spatial signature vectors of the new subscriber and other subscribers with on-going traffic”</b></p> <p><b>“2-D spatial signatures of the new subscriber and one or more subscribers with on-going traffic”</b></p>	<p><b>No construction necessary apart from the separate construction of “2-D spatial signatures.”</b></p>
<p><b>“new accessing subscriber spatial signature”</b></p> <p><b>“new subscriber spatial signature”</b></p>	<p><b>No construction necessary apart from the separate constructions of “spatial signature,” “new subscriber,” and “new accessing subscriber.”</b></p>
<p><b>“on-going traffic spatial signature”</b></p>	<p><b>No construction necessary apart from the separate construction of “spatial signature.”</b></p>
<p><b>“new accessing subscriber spatial signature register”</b></p>	<p><b>“a register, or a subdivision of a register, that stores one or more new accessing subscriber spatial signatures”</b></p>
<p><b>“new subscriber spatial signature register”</b></p>	<p><b>“a register, or a subdivision of a register, that stores one or more new subscriber spatial signatures”</b></p>
<p><b>“on-going traffic spatial signature register”</b></p>	<p><b>“a register, or a subdivision of a register, that stores one or more on-going traffic spatial signatures”</b></p>
<p><b>“an OFDMA traffic channel allocator”</b></p>	<p><b>“logic configured to allocate OFDMA traffic channels based on one or more two-dimensional spatial signatures”</b></p>
<p><b>“OFDMA traffic channel”</b></p>	<p><b>Plain meaning</b></p>
<p><b>“OFDMA”</b></p>	<p><b>“orthogonal frequency division multiple access”</b></p>

United States Patent No. 6,904,283	
<u>Disputed Claim Term</u>	<u>Court's Construction</u>
<b>“cluster of subcarriers”</b>	<b>“logical unit that exists at the time of allocation and that is comprised of multiple physical subcarriers”</b>
<b>“a plurality of groups of at least one cluster of subcarriers”</b>	<b>Plain meaning</b>
<b>“OFDMA”</b>	<b>“orthogonal frequency division multiple access”</b>